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$n=9$.

218	229	240	251	172	183	194	205	216
228	239	250	180	182	193	204	215	217
238	249	179	181	192	203	214	225	227
248	178	189	191	202	213	224	226	237
177	188	190	201	212	223	234	236	247
187	198	200	211	222	238	235	246	176
197	199	210	221	232	243	245	175	186
207	209	220	231	242	244	174	185	196
208	219	230	241	252	173	184	195	206

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ON THE EQUATION $x^n+y^n=nz^n$.*

By **DR. JACOB WESTLUND, Purdue University.**

E. Maillet† has proved that the equation

$$x^n+y^n=nz^n$$

is not solvable in rational integers, when n is a *regular*‡ prime. The object of the following note is to prove the impossibility of the above equation for any odd prime n, when z is not divisible by n.

If z is not divisible by n, it follows that neither x nor y can be divisible by n. We may also, without loss of generality, assume x and y relatively prime. Now it can easily be shown that x^n+y^n is either not divisible by n or is divisible by n^2 at least. For we have

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*Read before the Chicago Section of the American Mathematical Society, March, 1908.

†*Annali di Matematica,* Series III, Vol. 12. See also, *Acta Matematica,* Vol. 24.

‡A prime n is said to be a *regular* prime, when it is not a factor of the numerator of any one of the first $(n-3)/2$ Bernoullian numbers.

$$\begin{aligned} x^n+y^n &= (x+y-y)^n+y^n \\ &= (x+y)^n-n(x+y)^{n-1}y+\ldots+n(x+y)y^{n-1}, \end{aligned}$$

and since n is an odd prime, it follows that, if x^n+y^n is divisible by n, $x+y$ is also divisible by n, and hence x^n+y^n is divisible by n^2. From this follows directly the impossibility of the equation $x^n+y^n=nz^n$ when z is prime to n.

AN INTERESTING CLASS OF MONOTONIC FUNCTIONS.[*]

By ARTHUR R. SCHWEITZER, Chicago, Illinois.

1. In the *Rivista di Matematica*, Vol. 2, p. 43, Professor Peano has defined the following monotonic function. Representing the variable x of the interval (0, 1) by the series[†]

$$x=\sum_{k=1}^{+\infty}\frac{a_k}{m^k} \qquad m \geqq 2,\ a_k \geqq 1,$$

then he defines

$$t(x)=\sum_{k=1}^{+\infty}\left(\frac{a_k}{m^k}\right)^{n_k}$$

where the n_k are integers $\geqq 2$. In this paper the function of Peano is generalized in such a manner that a very large class of monotonic functions is obtained which includes other types than the preceding; also an explicit evaluation of certain properties is given.

2. As is well known,[‡] every point $0 \leqq x \leqq 1$ can be represented by the series

$$x=\sum_{k=1}^{+\infty}\frac{a_k}{\Pi_k}$$

where

$$\Pi_k=m_1\ m_2 \ldots m_k \qquad m_k \geqq 2.$$

The point x has a unique representation when $x=0$ or $x=1$ or $x=r/s$, where r and s are relatively prime and s is not a divisor of the product Π_k for any k. In all other points x is irrational, and therefore has a unique represen-

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[*] In this paper references will be made by notes to the following works: (1) Hobson's *Theory of Functions of a Real Variable*, Cambridge, 1907, (2) Jordan's *Cours d' Analyse*, Vol. I, (3) Chrystal's *Algebra*. These will be briefly referred to as "Hobson," "Jordan," and "Chrystal," respectively.

[†] Chrystal I, p. 165. Representing X by the radix fraction a, a_2, $a_3 \ldots a_n \ldots$ then we obtain $t(x)$ by the suitable interpolation of zeros, *e. g.*, $0\,a_1$, $0\,a_2$, $0\,a_3 \ldots 0\,a_n \ldots$

[‡] Chrystal, pp. 165, 166.